

**THE STRUCTURE OF TACTICAL
REVOLUTION IN THE U. S. ARMY FROM
1968 TO 1986**

**A MONOGRAPH
BY
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Infantry**

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ABSTRACT

THE STRUCTURE OF TACTICAL REVOLUTION IN THE US ARMY FROM 1968 TO 1986 by MAJ George T. Donovan, Jr., USA, 61 pages.

This monograph analyzes the shift in tactical doctrine in the US Army between 1968 and 1986. These dates bracket a period of major change when the Army struggled to match its tactical doctrine with the realities of late twentieth century armored combat. This monograph uses ideas suggested in Thomas Kuhn's book, *The Structure of Scientific Revolution*, to examine the forces that impelled doctrinal change, the manner in which change occurred, and the consequences. Kuhn's theory also offers a standard for evaluating revolutionary change. A comparison of the role of doctrine in the Army to scientific paradigms yields the conclusion that Army doctrine conforms to scientific paradigms. This conformity permits the application of Kuhn's model to analyze shifts in tactical doctrine. Analysis of the changes in the Army's tactical doctrine between 1968 and 1986 demonstrates that the shift in doctrine was revolutionary.

The monograph provides valuable insights into the challenges inherent with doctrinal change. An understanding of these challenges and the reasons that anomalies occur can provide an intellectual foundation beneficial to the Army as it prepares for future warfare. New strategies, technologies, environments for waging warfare, enemies, and operational concepts are all factors that can change tactical doctrine radically and force the Army to shift to a new doctrinal paradigm. An understanding of anomalies can provide an intellectual arsenal for contending with and overcoming the challenges likely to be encountered writing Army doctrine for the twenty-first century.


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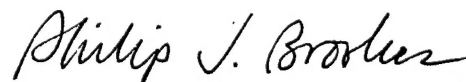
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LIST OF ABBREVIATIONS

ATGM	Anti-tank Guided Missile
MLRS	Multiple Launch Rocket System
NATO	North Atlantic Treaty Organization
OMG	Operational Maneuver Group
OOTW	Operations Other Than War
OPTEMPO	Operational Tempo
ROAD	Reorganization Objectives Army Division 1965
SAMS	Surface-to-Air Missiles
TRADOC	US Army Training and Doctrine Command

INTRODUCTION

This monograph addresses the changes in Army tactical doctrine implemented between the years 1968 and 1986. Using ideas suggested by Thomas Kuhn to examine the forces that impelled change, the manner in which changes occurred, and the consequences, the reader will gain an understanding of the difficulties that arise during periods of rapid and radical adjustment. This will provide an intellectual foundation for appreciating the specific doctrinal shifts that occurred during that period and anticipating the difficulties inherent in any process of doctrinal revision. Such an understanding can provide an intellectual arsenal for contending with and overcoming the challenges likely to be encountered writing Army doctrine for the twenty-first century.

The monograph analyzes the shifts in tactical doctrine between 1968 to 1986. These dates bracket a period of major doctrinal change in the US Army. The debate over a suitable doctrine coincided with great movements within the Army and in our national security policy. During that time, doctrine served as the driving engine of change to bring the Army out of its Vietnam mentality towards the realities of the modern battlefield.¹ That modern battlefield, envisioned as occurring in Europe, represented the most dangerous but least probable conflict: NATO against the Warsaw Pact in a full-intensity conventional, if not, nuclear war. The doctrinal development and debate, which started in 1973 and continued throughout the period, helped to prepare the Army for late

twentieth century armored warfare and the victory in Desert Storm.

The years between 1968 and 1986 were essentially a time when the US Army struggled to match its tactical doctrine with the realities of late twentieth century armored combat. Early in the period the Army realized that its existing doctrine was archaic – it no longer met the present realities of armored warfare. In the 1973 Arab-Israeli War, anomalies appeared that refuted our doctrinal paradigm, a doctrine that was based on the experiences of World War II. That doctrinal paradigm had evolved since 1945 to meet new tactical realities. However, it was unable to cope with the conditions witnessed in the 1973 Arab-Israeli War, specifically the “new lethality” of the late twentieth century armored battlefield. Recognition of these realities as anomalies impelled the change.

It is commonly held that during this time period American warfighting doctrine changed radically. The changes are evident in succeeding editions of FM 100-5, *Operations*, the Army’s capstone document. Published four times during the period, three of the editions vary greatly from each other. They are the 1968 edition, the 1976 edition (“Active Defense”), and the 1982 edition (“AirLand Battle”). The 1986 edition (also known as “AirLand Battle”) was mostly a clarification of the 1982 edition.

This monograph seeks to answer the following research question. Does the change in tactical thought in the U.S. Army from 1968-1986 fit Thomas Kuhn’s theory of the structure of scientific revolutions? To answer the research question, the following subordinate questions must be answered. What is Kuhn’s theory of the structure of scientific revolutions? Is doctrine the same as Kuhn’s paradigm? Was the change in tactical doctrine between 1968 and 1986 revolutionary in nature? That is, does the change in tactical doctrine fit Kuhn’s three criteria for revolutionary change?

The monograph uses Thomas Kuhn's theory about the structure of scientific revolutions as a baseline for understanding the difficulties associated with radical doctrinal change. In his book, *The Structure of Scientific Revolutions*, Thomas Kuhn analyzed the major scientific revolutions and developed a theory for why and how such events occur. Kuhn discovered that scientific progress and scientific revolutions are largely a function of paradigms – the underlying basis of scientific understanding and discovery.² He determined that scientific revolutions occur when the paradigm that governs the science fails to explain the universe as the scientific community expects. These revolutions occur in three stages. In the first stage, a community of scientists uses an accepted paradigm to expand the knowledge of the community. In the second stage a crisis occurs when an anomaly appears that shakes the paradigm to its core. In the third stage, the failed paradigm is replaced by a new paradigm that not only explains the anomaly but also holds greater promise for the future.

In his book, Kuhn debunked myths about the progressive nature of science by examining the role of paradigm shifts in the course of scientific progress. For Kuhn, paradigms were more than explanations of relationships between interrelated variables in a system. They also included rules for conducting research, values, beliefs, and techniques, as well as an example for conducting experiments.³ As such, the role of paradigms seems to correspond with the role of doctrine in the US Army.

If Kuhn's model is applicable to changes in tactical doctrine between 1968 and 1986, then his model can provide some valuable insights into the challenges and difficulties inherent with doctrinal change. An understanding of these challenges and the reasons that they occur could be of great value to the Army as it contemplates the realities of

warfare in the future. New strategies, technologies, environments for waging warfare, enemies, and operational concepts are all factors that can change tactical doctrine radically and force the Army to go through another turbulent time while converting to a new doctrinal system.

For the purposes of the monograph the following terms are defined as indicated:

Paradigm:

Paradigms are the “accepted examples of actual scientific practice – examples which include law, theory, application, and instrumentation together – [that] provide models from which spring particular coherent traditions of scientific research.”⁴

Paradigms commit members of a particular scientific community to the same rules and standards for scientific practice.⁵ The paradigm determines what applies and what does not apply to the field by specifying a common ground for work. Additionally, they provide a common language for discussing the work of the scientific field and serve as the basis for new practitioners to learn their trade.⁶

Kuhn used the word paradigm in two basic ways. In the first way it stood “for the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community.” The second way was as an example of a problem-solution that could be replicated as a model, which also demonstrated the rules for solving problems.⁷

Doctrine:

Doctrine, in the US Army, is the collected body of written documents and manuals that explain how the Army expects to fight in the next war. General William E. DePuy, the first commander of the Army’s Training and Doctrine Command (TRADOC), gave a good explanation of military doctrine. DePuy wrote:

The development and evolution of doctrine and its inculcation, mostly in

the minds and hearts of the officer corps, are the life thread and the pulse of the fighting services. By definition and natural law, doctrine is institutional in character. Doctrine and the institution which it nourishes, and in turn, on which it feeds, are exactly coextensive. There is no doctrine outside the institutional walls—nor can the institution creep outside the doctrine which is its rationale....[Doctrine] is the mainspring behind the development of effective fighting forces.⁸

Tactics:

“Tactics teaches the use of armed forces in the engagement....”⁹

Tactics may be subdivided into grand tactics and minor tactics. Minor tactics concerns arranging direct fire weapon systems for the engagement while grand tactics refers to arranging units on the battlefield. The focus of this monograph is on minor tactics. Tactical doctrine is the doctrine of minor tactics. This monograph refers to the tactical portions of the various editions of FM 100-5.

The criteria for analysis are a modification of Thomas Kuhn’s criteria from his book, *The Structure of Scientific Revolutions*. Kuhn used his criteria to show that paradigm shifts are revolutionary and not evolutionary in nature. To demonstrate a revolutionary shift in the tactical paradigm of the U.S. Army the following criteria must be met:

- A time-honored doctrine is rejected in favor of another incompatible with it.
- The new doctrine produces a consequent shift in the problems available for tactical scrutiny and in the standards, which the military profession determined what should count as an admissible problem or as a legitimate problem-solution.
- The new doctrine transforms the world within which the practioner of doctrine works; the practioner’s gestalt switches.

Application of these criteria determines if the change in American tactical doctrine between 1968 and 1986 was evolutionary or revolutionary. If the answer is revolutionary, than Kuhn's theory may assist in understanding the difficulties inherent in radical shifts in doctrine.

CHAPTER 1

KUHN'S MODEL OF THE STRUCTURE OF SCIENTIFIC REVOLUTIONS

In 1962 Thomas Kuhn published an historical study about revolutions in science entitled *The Structure of Scientific Revolutions*. He examined the major scientific revolutions of the past and developed a structural model to explain revolutionary change. Although not without its critics, the book was a major success and helped scientific communities understand the mechanics of scientific progress.¹⁰

Kuhn's interest in scientific revolutions originated while studying the history of various fields of science. The disagreements between social scientists about the nature of legitimate scientific problems and methods astonished him. Unlike practitioners of natural sciences, like physics and chemistry, social scientists argued frequently about what subjects were legitimate for their profession and what methods were applicable for their study. The reasons for such arguments among social scientists, and the lack of them between natural scientists, perplexed Kuhn. He found his answer in paradigms and the roles that they play in mature, developed fields of science, something towards which the social sciences were still striving.¹¹

Paradigms play a fundamental role in scientific revolutions because they play a crucial role in scientific research by providing the necessary and essential academic tools

for the conduct of research, what Kuhn terms “normal science.” Kuhn defined paradigms as the “accepted examples of actual scientific practice – examples which include law, theory, application, and instrumentation together – [that] provide models from which spring particular coherent traditions of scientific research.”¹² Paradigms commit members of a particular scientific community to the same rules and standards for scientific practice.¹³ The paradigm determines what applies and what does not apply to the field by specifying a common ground for work. Additionally, they provide a common language for discussing the work of the scientific field and serve as the basis for new practitioners to learn their trade.¹⁴

Normal science plays a large role in the accumulation of scientific knowledge because through scientific research, or normal science, scientists use a paradigm to extend their knowledge and to refine their understanding of a particular field. Once a paradigm is established, all research work is done on the basis of that paradigm. There is no research in the absence of a paradigm, whether or not it is acknowledged. During normal science, researchers do not test the validity of their paradigm, but rather, apply it to their field. They do not seek to find errors in the theory and are considered successful when they find none.¹⁵

Paradigms also play a fundamental role in scientific revolutions. As Kuhn demonstrated, scientific revolutions are actually profound shifts in paradigms. As such, scientific revolutions reveal much about the roles and functions of paradigms.

Kuhn found that scientific revolutions normally follow a common, three-stage structure. During the relatively calm first stage, practitioners use an existing paradigm to conduct normal science and widen the body of knowledge through the process of

discovery that application of a paradigm offers them.¹⁶ Although practitioners do not seek to test the validity of the paradigm, anomalies, which are unexpected outcomes that the theory cannot explain, do appear. The appearance of anomalies does not cause a crisis. Instead, they are noted, set aside, and generally considered as exceptions to the paradigm or as facts outside of the theory.¹⁷

The second stage, or crisis stage, is usually caused by the persistent discovery of an anomaly through the practice of normal science. Anomalies can exist for a very long time and not cause a crisis. A crisis occurs only when the anomaly penetrates deep into the paradigm and shakes its very foundations. The crisis sparks the scientific community into a wide-ranging and intense debate about the validity of the paradigm. New versions of the existing theory proliferate in an attempt to resolve the anomaly as competing schools of thought proffer new paradigms and defend their versions of the theory. It is a period marked by intense debate over the validity of the paradigm as the entire community moves towards a solution to the crisis.¹⁸

During the third stage, the crisis is resolved in one of three ways. In the first way, the current paradigm finds a way to explain the anomaly and passes the crisis through the process of normal science. A second way is that the anomaly resists resolution through new approaches and is set aside as a mystery since a solution is not imminent. These first two ways do not end in revolution. The last way, creation of a new paradigm, almost always, ends in revolution. New paradigms can emerge as candidates to replace the old, troubled one, however, these new paradigms must first go through a battle for acceptance by the community.¹⁹

The new paradigm emerges after the pronounced failure of the old and after a long,

generally intense period of debate. The paradigm changes rapidly, but not overnight. Often the newly accepted theory has been around for awhile, but never gained acceptance because of a lack of a crisis to shake the old paradigm.²⁰

It is important to note a few significant matters concerning the adoption of a new paradigm. First, once a theory has reached the status of a paradigm, rejecting the old paradigm is a difficult process.²¹ The community of practitioners defends it strongly since all of their work and their way of thinking is based upon it. During the crisis, the paradigm is buffeted and the rules binding the community to it are loosened as scientists use different, non-standard approaches to resolve the anomaly. This buffeting weakens their adherence to the paradigm as well as the paradigm's hold on the community.²²

Secondly, troubled paradigms are not rejected out of hand, but only after comparison of results with the use of a new paradigm. An alternative must be available, and that alternative must be able to explain not only the anomaly, but all earlier observations as well. It must also promise better application in the future.²³

The old theory is rejected and is no longer valid. All old work done under the old theory must be redone because the rules have changed. New rules require the reevaluation of prior fact. New theories are needed to permit predictions that are different from those of predecessors. To continue to use the old paradigm would mean that it was still valid. Therefore, the old one must be displaced.²⁴

A new theory changes the rules for its application. There are changes in what constitutes a legitimate problem for the field, as well as changes in methods, instrumentation, concepts, explanations, and even language. The field of study is transformed by significant shifts in the criteria determining the legitimacy of both the

problems to be examined and the proposed solutions. In essence, the new paradigm provides scientists not only with a map, but also essential directions for map-making.²⁵

The transition to the new paradigm is not a cumulative process. It is not an articulation or extension of the old paradigm. It is a revolutionary step, a reconstruction of the field from new fundamentals. When the transition is complete, there is a new orientation which manifests itself in a new, world view. Scientists do not see something as something else, "they simply see it." It is a switch of gestalt.²⁶

The differences are most apparent in the three, key changes that occur during a scientific revolution. These three changes are the defining characteristics of revolutions. They are:

- Each revolution forces the community to replace its existing theory with one incompatible with it.
- Each revolution changes the problems available for solution, the problem-solution set, and the rules for conducting research.
- Each revolution transforms the world within which the scientist works; the scientist's gestalt switches.²⁷

Kuhn's model provides the reader with an explanation for understanding the role that paradigms play in paradigm-based organizations. He also provides an explanation for why paradigms shift and what causes them to shift. Additionally, he provides a means to evaluate and categorize the type of change that a paradigm is undergoing, evolutionary or revolutionary. This means that if military doctrine is the same sort of entity as Kuhn's paradigm, then Kuhn's model offers a means to evaluate and analyze doctrinal change.

CHAPTER 2

FROM KUHN'S MODEL TO TACTICAL DOCTRINE

Doctrine, in the US Army, is collected in a body of written documents and manuals that explain how the Army expects to fight in the next war. It reflects national strategy, examines the enemy's (or enemies') capabilities and methods for conducting warfare, and assesses the technological capabilities of organizations. Doctrine portrays the nature of battle and war, gives guidance on leadership, and assesses the impact of moral forces. It prescribes how combat organizations and supporting forces should be employed, arrayed, and sequenced on the battlefield to achieve victory and gain national objectives. It also reflects the tradition of the armed forces and is based not only on historical experience, but also on emerging ideas, concepts, technological capabilities, and goals. Doctrine should be rigid enough to be applied across the spectrum of conflict in a similar manner to the end of common understanding. It ought not be so rigid that it cannot change over time with the advent of new technologies and operational concepts or changing strategic policies or problems.²⁸

The 1986 version of FM 100-5 explains the role of doctrine in the US Army in Kuhnian terms.

FM 100-5 is the Army's keystone warfighting manual. It explains how Army forces plan and conduct campaigns, major operations, battles and engagements in conjunction with other services and allied forces. It furnishes the authoritative foundation for subordinate doctrine, force

design, materiel acquisition, professional education, and individual and unit training. It applies to Army forces worldwide, but must be adapted to the specific strategic and operational requirements of each theater. While emphasizing conventional military operations, it recognizes that Army forces must be capable of operation effectively in any battlefield environment, including low intensity conflict and on the nuclear and chemical battlefield.²⁹

Doctrine, as expressed in and by FM 100-5 for the US Army, is an equivalent of Kuhn's paradigm. Doctrine explains the nature and conditions of warfare as known at that time.³⁰ Like scientific paradigms, it is universally applicable for the US Army. The army expects to employ it on any battlefield, at any location in the world, against any type of foe, in any kind of environment.³¹

For scientific communities, a paradigm is the basis for research, which is the application of the theory to produce results. The same is true for doctrine. The practical application of doctrine is warfighting and training for war. Training and fighting are expected to be done on the basis of a doctrine, not outside of it.

Doctrine also provides for the other functions about which Kuhn wrote – the underlying, unspoken assumptions that permit application of the paradigm. Doctrine provides the necessary and essential intellectual tools for the conduct of war by explaining the nature of war, setting standard definitions, explaining operational concepts, providing examples on how to fight, setting standards or principles for the use of equipment and organization, and establishing standards for solving tactical problems. Just as a scientific community uses a paradigm to teach new members its profession, military doctrine is the basis for the education of officers, non-commissioned officers, and soldiers. Doctrine commits the entire army to the same rules, principles, and standards for the conduct of war. It explains what military problems must be solved and

how they should be solved. The commitment to one system of beliefs promotes mutual understanding and the ability to work together.

To be effective, doctrine should reflect the demands and expectations of all three levels of war: strategic, operational, and tactical. Strategically, it should ensure that military operations can support strategic goals in any theater of war. Operationally, a doctrine should facilitate campaign planning and ensure that battles are fought to support strategic goals. Tactically, doctrine enables units to win battles by “describing how arms and services should be organized effectively on the battlefield.”³²

FM 100-5, *Operations*, the Army’s chief doctrinal manual, is also the basis for the Army’s tactical doctrine. In *On War*, Clausewitz provides a useful definition of tactics by writing that “tactics teaches the use of armed forces in the engagement....”³³ The definition is useful in that it separates the concept of tactics from that of strategy. Traditionally, tactics is further subdivided into grand tactics and minor tactics. Minor tactics concerns the arrangement of the effects of weapon systems in the engagement while grand tactics refers to arrangement of units on the battlefield for the battle.

If doctrine conforms to a paradigm in both definition and use, then Kuhn’s model of revolutionary change should apply to radical shifts in doctrine (or in Kuhnian terms, the doctrinal-paradigm). By analyzing the shifts in doctrine in the US Army between 1968-1986, some or all three stages of Kuhn’s “structure of the scientific revolution” should be apparent. If there indeed was a revolution, then the doctrinal paradigm should change according to Kuhn’s pattern.

To demonstrate a revolutionary shift in the tactical doctrine of the U.S. Army, the following criteria must be met:

➤ A time-honored doctrine is rejected in favor of another incompatible with it.

➤ The new doctrine produces a consequent shift in the problems available for tactical scrutiny and in the standards, which the military profession determined what should count as an admissible problem or as a legitimate problem-solution.

➤ The new doctrine transforms the military imagination in ways that would ultimately need to describe as a transformation of the world within which tactical work was done.

By examining the changes that occurred in the tactical doctrine of the US Army between 1968 and 1986 against these criteria, the reader will gain a better understanding of the nature of change that occurred. The monograph establishes, using a scientifically accepted theory of change, the magnitude of doctrinal change that occurred. If the change was revolutionary, we can explain using Kuhn's model some of the reasons for the institutional difficulties experienced in paradigm shifts. This could help the Army in the future.

CHAPTER 3

CHANGES IN TACTICAL DOCTRINE BETWEEN 1968 AND 1986

The years between 1968 and 1986 may be characterized as a period when the US Army moved from a tactical paradigm based on the experiences of World War II to one based on the realities of late twentieth century armored warfare as it was reflected in the 1973 Arab-Israeli War. The doctrinal shift was significant. Some have even argued that the shift was revolutionary.³⁴ The shift in doctrine was reflected in the various editions of FM 100-5, *Operations*, which were published in 1968, 1976, 1982, and 1986. The most radical changes occurred in the 1976 and 1982 editions. These two editions differed dramatically from the previous, almost standardized model based on the American experience in World War II. These two editions reflect Kuhn's second stage, a time when the community energetically debates the legitimacy of its doctrine and searches for a new paradigm to replace the old, discredited paradigm. The 1986 edition signified the acceptance of the 1982 paradigm and a return to "normal science."

1968 Doctrine

The 1968 version of FM 100-5 was essentially an updated version of the Army's successful World War II doctrine.³⁵ The Army had changed its tactical doctrine in small increments over the intervening years to reflect the advent and growth of new

technologies and changing strategic conditions.³⁶ Its successive presentations reflected the Army's varied experiences in World War II, Korea, and Vietnam. It was designed for operations anywhere in the world. It was accepted as applicable to the combat environments of nuclear, conventional, unconventional, and cold war.³⁷

The 1968 manual reflected the extant realities of American strategy in Vietnam and Europe; wars limited to a defensive strategy for political reasons. It also reflected the combat environment of the Vietnam War, which was ongoing at the time of the writing. New operational environments and the impact of technology were reflected in sections concerning counter-insurgency warfare, airmobile tactics, improved capability for command and control, increased firepower, and a developed use of tactical air power.³⁸

Doctrine for minor tactics emphasized offensive action to destroy the enemy. It emphasized the use of technology and firepower, instead of maneuver, as the key to solving tactical problems.³⁹ Offensive action was preferred, while the defense was used only as a temporary means for returning to the offensive.⁴⁰ Mobility, especially using helicopters, enabled tactical units to concentrate quickly against the enemy and defeat him using superior firepower. The concept of combined arms stressed the use of infantry to find the enemy, while various fire support means, to include artillery, gunships, and close air support (CAS), would destroy him through superior firepower. Except for the addition of new technologies, the doctrine had progressed little since the 1950s,⁴¹ and thus, did not appear to address the emerging "new lethality" of late twentieth century armored warfare. This "new lethality" would challenge the basic assumptions of combined arms warfare.

Initially after the Vietnam War, the US Army was content with its tactical doctrine and considered it “generally sound.”⁴² During the war, various tactics, techniques, and procedures had been developed that gave the army a decided tactical edge over the North Vietnamese regulars. The doctrine, however, was not without its critics. Some officers were uncomfortable with the emphasis on firepower and technological solutions to tactical problems while others disliked the emphasis on attrition and considered such a doctrine incapable of achieving strategic victory.⁴³

Doubts about the suitability of the doctrine increased after the shift in national security strategy following the Vietnam War. The Nixon Doctrine became national policy. It stipulated that the greatest threat to American security interests was in Europe. In response to the new strategic policy, the US Army focused its attention on a possible confrontation with the Warsaw Pact on the central European plains where NATO forces could start any war not only on the strategic defensive, but on the operational and tactical defensive as well.

The US Army was unprepared for a confrontation with the Soviets in Europe. While the Army had focused its attention and effort on Vietnam, it had lost a generation of modernization of equipment and tactics. The Soviets and their Warsaw Pact allies had taken advantage of the opportunity to modernize and build an effective offensive combined arms team centered on the tank.⁴⁴ They had developed a doctrine to fight and win without nuclear weapons. This doctrine emphasized concentration of a greater numbers of tanks and armored vehicles, speed of attack, and echelonment in depth. Soviet forces planned to use a penetrating attack, to mass all forces on a narrow front to

overwhelm NATO forces and move quickly into the operational depth to defeat NATO forces.⁴⁵

The new focus on Europe created a sense of unease with US doctrine. In Germany, US and NATO forces were clearly outnumbered by the Warsaw Pact. They faced a technologically superior enemy who also had the numerical means to defeat our forces. The US Army, just starting a long process of modernization, was playing a game of catch up to the Soviets.⁴⁶

Stronger criticism of the 1968 doctrine started after the 1973 Arab-Israeli War (Yom Kippur War). The short, but intensely lethal, conventional war provided a laboratory for the US Army to analyze the realities of late twentieth century combat. From the tactical experience of both the Israeli and Egyptian forces, several lessons were clear. These lessons had even more import for the US Army because the Israelis and Egyptians fought using American and Soviet equipment. The realities of the war indicated deep, paradigm shaking, anomalies in American tactical doctrine.

The biggest anomaly was the unprecedented lethality of the battlefield, evidenced by the great destruction of tanks. The Israelis considered the tank the most important weapon system on the battlefield and had built their tactical organization around it. However, in the 1973 war, this primary weapon system was highly vulnerable to dramatically improved tank guns and other, new weapon systems.⁴⁷ Tank guns had increased in lethality by 13 times since World War II.⁴⁸ The introduction of new technology in the form of suitcase sized, man portable anti-tank guided missiles (ATGMs) made armored vehicles even more vulnerable – and for the first time in a long while, vulnerable to infantry, instead of only other tanks.⁴⁹ Tanks, unsupported by

infantry, were destroyed at rates that would evaporate the number of tanks in the American army in Europe in an extremely short period of time.⁵⁰ Additionally, the presence of sophisticated surface to air missiles (SAMs) in tactical units greatly hindered tactical aircraft flying traditional close air support missions. Egyptian SAMs, deployed forward in tactical units, enabled a dense and deep concentration of air defense systems that could be defeated over time only by coordinated ground and air attacks.⁵¹

Adding to the Army's problems was a lack of confidence in its ability to win. Officers and soldiers in Europe considered themselves "speed bumps" and did not believe in their ability to defeat an attack by the Warsaw Pact.⁵² The lack of preparedness of US forces in Europe, coupled with the stark realities of the 1973 War, sparked a sense of urgency to overhaul doctrine in General William E. DePuy, the commanding general of TRADOC, and others within TRADOC. They believed that the US did not have the means to successfully execute the mobile defense espoused in the 1968 doctrine and expressed the belief that the US Army was "tactically and operationally bankrupt...."⁵³ Doctrine demanded drastic change. General DePuy set out to fix these problems, using the 1976 doctrine as the engine of change.⁵⁴

1976 Doctrine – Active Defense

The 1976 doctrine reflected a change in the concept for Army operations caused by several factors. First, the Americans had relied traditionally on numerical superiority in manpower and materiel to win their wars. Mobilization was key to such a method of fighting. However, the strategic situation in Europe with the Warsaw Pact forces mobilized and "on the border" did not give any time for mobilization.⁵⁵ Moreover, the unprecedented lethality and tempo of the 1973 Yom Kippur War pointed towards a quick

and lethal war, denying dependence on mobilization as an acceptable strategy. Secondly, a defense in operational depth was not a viable option. The US did not have the forces in Germany to conduct a defense in depth.⁵⁶ Moreover, Germany demanded a "forward defense," making it politically infeasible for the US to defend in great depth on German territory.⁵⁷

The Army expected to fight outnumbered in the beginning of a war in Europe without an opportunity to mobilize additional forces. Therefore, the next war would be a "come as you are war"⁵⁸ and the Army had to "prepare its units to fight outnumbered, and to win."⁵⁹ For these reasons, the US Army prepared "to win the first battle of the next war."⁶⁰ Winning the "first battle" was the key operational concept of the new doctrine, and as such, placed enormous demands on tactical skill.⁶¹

DePuy believed that the core of the new doctrine needed to reflect the new and unprecedented realities of the modern battlefield. He and other senior officers also believed that the Army could fight and win in Europe without resorting to battlefield nuclear weapons.⁶² To DePuy the main problem confronting doctrine was "how to fight outnumbered on a densely packed and lethal battlefield . . ." and win.⁶³ He saw the solution in a radically redefined concept of combined arms at the minor tactical level, in which the main challenge was to bring the capabilities of all weapons systems to bear in concert to achieve the objective of destroying the enemy and winning the first battle.⁶⁴ This meant developing a doctrine that could bring the largest number of heavy weapons systems to bear with forces designed to contain as many of these weapons systems as possible.⁶⁵

The new concept centered around the tank, but closely interwove the unique capabilities of other weapon systems to create a synergistic combined arms unit that exploited the strengths of each type of weapon while counteracting each system's inherent weaknesses. DePuy rewrote the fundamentals of tactical formations and movement techniques to exploit strengths while minimizing weaknesses.⁶⁶ DePuy wrote:

The theory behind the use of a combined arms teams is simple. In order to win, whether attacking or defending, you must move. In order to move in the face of modern weapons, those weapons must be suppressed. The infantry must suppress close-in weapons while mortars, artillery, and air strikes suppress or obscure more distant enemy weapons. Forward mobile air defense weapons keep enemy attack aircraft off the moving force. This is the mutual interaction of a combined arms team. Through this kind of action the force can move quickly to the decisive point on the battlefield and obtain the force ratio necessary to win.⁶⁷

DePuy believed that the Army needed to be qualitatively superior to defeat a quantitatively superior foe.⁶⁸ Superior tactical skills were more important than quantitative superiority, which in any case was unlikely.⁶⁹ DePuy believed that success could be built upon "the excellence of our techniques and tactics."⁷⁰ He wrote:

Therefore, an EFFECTIVENESS EDGE is an absolute requirement for the USA - that is, an edge over the Warsaw Pact.... Another way to describe an EFFECTIVENESS EDGE would be current readiness plus: Better equipment, better organization, better tactics, better training, better support, better morale, [and] better soldiers.⁷¹

Very high tactical and technical skills would be needed to defeat a well-trained enemy and leadership and morale would have to be very high to survive the rigors and intensity of modern combat.

In DePuy's eyes these concepts meant the requirement for new formations and techniques of fire and movement for small units.⁷² The new emphasis was on company/team commanders as the basic elements for fighting.⁷³ *"Captains and their*

companies, troops, and batteries fight the battle.” Commanders of brigades and battalions played a vital role in this by “*controlling and directing the battle.*”⁷⁴

Concentration of forces was essential in order to destroy the enemy.⁷⁵ Force ratios were considered crucial for victory. They were to be achieved by transferring laterally “less committed or lightly engaged force to reinforce troubled spots”⁷⁶ to concentrate at the decisive place and time. Superior headquarters played a critical role by concentrating forces. The central concept for larger formations was to:

See deep to find the following echelon, move fast to concentrate forces, strike quickly to attack before the enemy can break the defense and finish the fight quickly before the second echelon closes, all this while using the defender’s natural advantage - terrain - to multiply the strength of the defense.⁷⁷

The doctrine discouraged the use of reserves at every level.⁷⁸ The Army in Europe was outnumbered and need to utilize most of its forces forward to fight the first battle, not held back for future battles. The Army commander could not afford the number of forces withheld if each echelon maintained a thirty percent reserve.⁷⁹

The 1976 manual recognized a fundamental shift in relationship between the Air Force and Army. It stated:

MODERN BATTLES are fought and won by air and land forces working together. Both the Army and the Air Force deliver firepower against the enemy. Both can kill a tank. Both can collect intelligence, conduct reconnaissance, provide air defense, move troops and supplies, and jam radios and radar. But neither the Army nor the Air Force can fulfill any of these functions completely or by itself. Thus, *the Army cannot win the land battle without the Air Force.*⁸⁰

The complex and important requirements for interaction and cooperation between air and land forces necessitated both forces coming together on the battlefield to defeat the enemy.⁸¹ The contribution of the Air Force to the Army was in five main categories.

First, gain and maintain air superiority so that Army forces can exploit their mobility and concentrate on the battlefield. Second, provide reconnaissance and intelligence about the enemy. Third, conduct battlefield interdiction operations with the objective of defeating second- and third- echelon forces before they could enter the battle with land forces. Fourth, provide close air support. Finally, provide tactical airlift of materiel and troops on the battlefield.⁸² These five missions and the close interaction required made the role of the Air Force critical and vital to the success of the Army. The concept for close interaction and cooperation essentially made Army doctrine dependent upon an outside organization, the US Air Force.⁸³

These concepts presented a “drastically new vision of tactical warfare” derived from a recognition of the new realities, a new strategic emphasis, and a non-traditional operational concept.⁸⁴ Because of its focus on a possible conflict in Europe, the doctrine emphasized the defense. This emphasis also reflected a lesson of the 1973 Arab-Israeli War: the restoration of the advantage of the tactical defense over the tactical offense.⁸⁵ However, the qualitative approach and emphasis on the tactical defense implied a slugging match, or, attrition-based warfare with high rates of loss. Victory would be a function of being able to kill as well as absorb losses.⁸⁶

Despite strong support for the 1976 version of FM 100-5 by the US Air Force and the German Army, the doctrine did not receive broad acceptance in the Army. This occurred for several reasons. Many considered that the doctrine was too preoccupied with Europe and, therefore, was not practical for other theaters of war. The focus of the Army’s capstone doctrine needed, it was thought, a more universal applicability in any possible theater of war.⁸⁷ The defensive mentality of the doctrine especially rankled

many officers, who preferred what they saw as the traditional American offensive approach to warfare. They pointed out that the best such a defensive doctrine could accomplish was an avoidance of defeat. They believed that the US needed a doctrine with which it could obtain victory, whatever that was.⁸⁸

Criticism of the 1976 manual started within a month of its publication.⁸⁹ The criticism came not only from circles within the Army, but from outside the Army as well. Criticism centered on key concepts within the manual: its defensive emphasis; its orientation on winning the "first battle;" its portrayal of the doctrine of the Warsaw Pact; and its prescriptions about tactical reserves. Additionally, critics expressed dissatisfaction with the doctrine's reliance on firepower and concentration tactics.⁹⁰ Over time, additional criticism developed about the operational concept and the failure to address larger unit operations, or grand tactics.

A leading critic of the new doctrine was William Lind, a Congressional staffer who worked for Senator Gary Hart of Colorado. In an article published in *Military Review*, he wrote a scathing attack on the doctrine, blasting its central concepts of "fight outnumbered and win," "win the first battle," the new lethality, its emphasis on firepower and attrition verses what he called maneuver warfare, and its emphasis on the defense.⁹¹ He raised significant doubts about the doctrine's ability to win the second battle, expounding that the Army would consume all of its resources in the first battle, leaving nothing with which to continue the war.⁹² Lind argued that in the past, American operational theory had evolved around fighting as many battles as necessary wherever the enemy wanted, whenever he wanted, to wear him down in a battle of attrition. This operational theory was no longer valid given the same strategic assumptions that DePuy

had used in developing the 1976 doctrine. A different approach, Lind argued, was possible and it involved a maneuver-based doctrine to create operational shock to defeat the enemy by destroying his own coherence and synergy of action.⁹³

Other critics noted that the doctrine would not be successful against the Soviet threat. The Soviets had recently changed their doctrine from a penetration attack to the use of an Operational Maneuver Group (OMG) to strike into operational depths to destroy the coherence of the defender's deployment. They believed the new doctrine would increase Soviet chances to achieve operational success conventionally and reduce their reliance on the employment of nuclear munitions. The new Soviet doctrine stipulated a broad, frontal attack to fix defending forces forward. The operational commander would then insert an OMG to break through the defenses and move to operational depth to wreak havoc on NATO's rear areas.⁹⁴ Such an attack would nullify the ability of a lateral transfer of forces that the US doctrine relied on for its force ratios.

Along with Lind, others criticized the attrition-based concepts that necessitated superior force ratios at the decisive point to defeat more numerous Soviet forces. Given such battlefield calculus, only the first Soviet operational echelon could be defeated. The second operational echelon would most probably defeat forward deployed forces, forcing NATO to resort to nuclear weapons, something that the doctrine sought to avoid. Additionally, the focus on battlefield calculus and technological aspects of war bothered others who considered that the manual lacked a proper emphasis on historically proven lessons such as the importance of leadership, the moral domain, and principles of war.⁹⁵

Another reason for the doctrine's lack of acceptance was that it was seen as too tactical. The doctrine left a "doctrinal vacuum at echelons above division" by failing to

provide principles of action for higher units. Extension of the doctrine's minor tactical techniques to the corps (grand tactics) was not a feasible solution since operations above division level were not considered to be either purely tactical nor purely strategic. The doctrine lacked a good concept for intermediate operational matters.⁹⁶

In short, the doctrine found little confidence in the field.⁹⁷ The American Army did not believe that it could win the next war in Europe with it and doubted its suitability for other theaters. At best, the army was confident that it could defeat the Soviet's first operational echelon before losing or reverting to the employment of battlefield nuclear weapons.

1982 Doctrine – AirLand Battle

Six years after the publication of Active Defense, the next edition of FM 100-5 was published. This edition was called AirLand Battle. It depicted future warfare in generally the same manner as the 1976 edition and it was premised on the same strategic environment, although it had a more global application. A significant change was the inclusion of a new perspective of the Soviet threat. The doctrine recognized the increased capability that the Soviet forces had achieved through their modernization program and recognized the doctrine of the OMG as the enemy's most likely course of action.⁹⁸

The US Army had continued its force modernization programs and now started to receive new equipment, "the big five" - weapons systems, which General Abrams had sought.⁹⁹ At the tactical level, these new systems signaled a qualitative improvement in capability – greater firepower and mobility. The Army also improved its means for conducting deep battle in the form of new sensors and longer-range artillery. Deep battle

capabilities were further enhanced by the fielding of the Apache helicopter (one of the “big five”) and improvements in the means of coordination and control of Air Force aircraft flying in the roles of air interdiction and CAS.

Responding to the various criticisms of Active Defense, TRADOC initially intended to defuse opposition to the 1976 manual by revising DePuy’s work to solve the challenge presented by follow-on echelons. However, the doctrine writers failed to find a suitable revision, and instead, produced a new way of thinking about the problem. The new thinking was an increased emphasis on operations¹⁰⁰ that contained a more comprehensive and balanced view of late twentieth century warfare.¹⁰¹ The manual stated:

The Army’s basic operational concept is called AirLand Battle doctrine. This doctrine is based upon securing or retaining the initiative and exercising it aggressively to defeat the enemy. Destruction of the opposing force is achieved by throwing the enemy off balance with powerful initial blows from unexpected directions and then following up rapidly to prevent his recovery. The best results are obtained with initial blows struck against critical units and areas whose loss will degrade the coherence of enemy operations rather than merely against the enemy’s leading formations.¹⁰²

The manual raised its focus to larger units and introduced the concept of the operational level to the US Army. AirLand Battle provided a concept for defeating the second- and third- echelon forces in addition to defeating the first echelon along the forward battle zone.¹⁰³ This additional success was to be achieved through a deep battle, whose central concept was the engagement of follow-on echelons simultaneously with the attack of the first echelon. At the same time, friendly forces would protect their rear areas to prevent the enemy from conducting deep operations in their rear. The operational level commander and even grand tactical commander sought to delay,

disrupt, divert, or even defeat follow-on echelons before they entered into battle with US ground forces.¹⁰⁴

Because of its operational focus, the paradigm for minor tactics in the 1982 edition of FM 100-5 is not readily apparent. The manual raised the level of tactical focus to the division and corps levels, or the grand tactical level, and did not address minor tactics to the level of detail found in the 1976 edition. This could be done because the prescriptive principles of Active Defense had been incorporated into subordinate doctrinal publications,¹⁰⁵ and thus, into the Army's thinking at the minor tactical level. The new doctrine could focus on what the previous edition did not address; grand tactics that were oriented on fighting in depth, as opposed to laterally. Withheld reserves again found a critical role on the battlefield as a counter-attack force.¹⁰⁶

The 1982 edition modified some of the concepts of Active Defense to better represent the Army's thinking and to improve its basic concepts in accordance with historical lessons. It placed greater emphasis on the intangible elements of combat power while placing less emphasis on force ratios.¹⁰⁷ It placed considerations of leadership and an understanding of the human dimensions of warfare on par with those of the physical elements of warfare that were stressed in Active Defense.¹⁰⁸ The means for elevating these intangible aspects was through the concept of combat power, which is comprised of firepower, maneuver, protection, and leadership.¹⁰⁹ Of the four components, leadership was the most important. Additionally, the tenets of initiative, agility, depth, and synchronization were added. These tenets applied equally to tactics as well as operations.¹¹⁰

The maintenance of initiative, rather than force ratios, became the central focus of AirLand Battle.¹¹¹ The manual stated:

This doctrine, AirLand Battle, is based on retaining the initiative and exercising it aggressively to defeat the enemy. Destruction of the opposing force is achieved by throwing the enemy off balance with powerful initial blows from unexpected directions and then following up rapidly to prevent his recovery.¹¹²

This quote reflects the mindset of General Starry, commander of TRADOC from 1977 to 1981, who was responsible for oversight of the writing of the manual. He was convinced that given reasonable force ratios, the side that seized the initiative in battle possessed a statistically greater chance of winning.¹¹³

The 1982 edition of FM 100-5 restored the balance between the offense and defense by placing greater emphasis on the offense. This made the doctrine more applicable for other possible theaters of war in addition to Europe. The principles and purpose of defense were still stressed, but it was recognized that a purely defensive doctrine could not bring victory on the battlefield. The doctrine sought to balance the offense and defense in other ways as well. Within the concepts of operational art, defensive and offensive operations could occur simultaneously. For example, in an operational defense, the tactical offense was considered an effective way to defeat the enemy. Such a defense mixed static and dynamic elements to seize the initiative from attacking forces.¹¹⁴ The commander could use defense and offensive operations together to produce desired operational effects.

The Air Force also played a major role in the 1982 AirLand Battle doctrine. The chosen name for the doctrine, AirLand Battle, implies a close cooperation between air and ground forces. The Air Force was an equal partner in AirLand Battle.¹¹⁵ Its role was

critical and vital to success.¹¹⁶ The Air Force retained from the 1976 manual the same battlefield missions in relation to the Army. Again, the Army essentially declared its dependence on the Air Force to fight the deep battle. However, the Army implied in the doctrine that Air Force assets conducting deep battle would be under the control of Army commanders.¹¹⁷

The 1982 doctrine was accepted widely, both by the officer corps and by civilians interested in military doctrine. The introduction of an operational level of action solved the anomaly of fighting outnumbered while defending forward. The operational concepts also promised future success in application not only in Europe, but in other theaters as well. It had the added bonus of offering a possibility of success in Europe, without having to resort to nuclear munitions.

The 1982 edition did cause some problems in NATO. Whereas previously NATO had criticized the 1976 edition for being too defeatist and defensive in nature, they saw the new doctrine as too offensive. The doctrine's emphasis on the offense, coupled with President Reagan's political attacks on the Soviet Union, unsettled the alliance, whose members thought that the doctrine might be too aggressive.¹¹⁸ Additionally, the deep battle concepts in the doctrine conflicted with NATO's own concept of follow-on forces attack.¹¹⁹ NATO did not want to change their deep battle plans to reflect the US Army doctrine.

In the years following the publication of the 1982 manual, the study of large unit operations increased in the US Army. A better understanding of what became known as operational art led to the discovery of faults in the 1982 edition. The operational level of war had been defined as a "broad division of activity in preparing for and conducting

war....[and] most simply, it is the theory of larger unit operations.”¹²⁰ Critics disapproved of this definition, considering it imprecise and insufficient for a proper understanding of the creative activity now called operational art.¹²¹ Although the 1982 manual had been considered “good enough,” in 1984 the Army undertook a process to revise and update the 1982 doctrine in light of experience gained in research and in the field.¹²²

1986 Doctrine – AirLand Battle

The doctrine in the 1986 edition of FM 100-5 was also entitled “AirLand Battle.” It was essentially an updated version of the 1982 edition that confirmed the general correctness of the earlier edition. It also reflected new knowledge about operational art and clarified misconceptions about AirLand Battle doctrine. The authors of the 1986 edition recognized that the Army had accepted AirLand Battle doctrine and that the “basic thrust of AirLand Battle was on the mark.”¹²³ However, the dramatic change between the 1976 and 1982 editions of FM 100-5 had caused some confusion in the understanding of its main principles. Some of this confusion had been caused by the publication of various operational concepts that were developed simultaneously after 1976 as the Army moved towards the new doctrine.¹²⁴

The world view or view of future war and future threat changed little in the new publication. However, in response to the requirement to support more contingency operations, the new manual recognized the need for a greater capability to deploy forces from the United States to any “hot spot” around the world. The 1986 edition attempted to clarify some misinterpretations of AirLand Battle doctrine. A glaring misinterpretation was that AirLand Battle doctrine was a strategy. The new edition repeatedly made it clear that AirLand Battle doctrine applies only to tactical and operational methods and

that these methods are subservient to the dictates of theater strategy and national political concerns.¹²⁵

Another misinterpretation was that the principles of AirLand Battle doctrine only applied to operations and not to tactics. Some had believed that only fire and maneuver applied to tactics, while the concepts of thinking, anticipation, and maneuver applied to operations. The manual clarified that these concepts were applicable at all levels, as were the principles of war. Furthermore, the authors added a section entitled "Structure of Modern Warfare" to reduce confusion about the elements of and connections between strategy, operations, and tactics.¹²⁶

Another confused concept was deep battle. Some officers had assumed that deep battle was of greater importance than the close or rear battles. Others had said that AirLand Battle doctrine did not apply to them since they did not have the means to conduct deep battle. To clarify this problem, the authors eliminated the concept of three separate battles: deep, close, and rear. They replaced it with an explanation that "campaigns, major operations, battles, and engagements have close, deep, and rear components and that this has always been so." Close operations were to have primacy, but rear and deep operations would impact on future events. "Current close operations must succeed to earn the fruits of those efforts." Operations in depth were seen to have real relevance for the close fight.¹²⁷

The radical shift from the defensive orientation of Active Defense to AirLand Battle had caused widespread misinterpretations of AirLand Battle. The 1986 edition sought to balance the emphasis between offensive and defensive operations by avoiding "over exaggeration of the advantages of the offensive." Additionally, the authors clarified the

role of offensive tactics within an operational defense.¹²⁸ The 1986 edition re-emphasized the values of leadership and the importance of understanding the human element in warfare. These concepts were further clarified to aid understanding. Additionally, the authors placed greater emphasis on leadership, morale, training, unit cohesion, skill, and courage.¹²⁹ The new manual addressed campaign planning in more detail. It placed greater emphasis on operational art and sustained multi-engagement operations within a theater of operations.¹³⁰ The authors defined operational art as “the employment of military forces to attain strategic goals in a theater of war or theater of operations, through the design, organization, and conduct of campaigns and major operations.”¹³¹

The 1986 edition of FM 100-5 received little criticism and was considered to be the paramount warfighting doctrine produced by the US Army. Many officers still consider this to be true today.¹³² Its strengths as well as its acceptability to the Army and national strategic planners can be noted in the success of its application in Panama, during Operation Just Cause, and in the Middle East, during the Gulf War. Additionally, the varied geography of these operations testifies to the universal applicability of the doctrine.

CHAPTER 4

COMPARISON OF CHANGES TO KUHN'S MODEL

The changes in US Army tactical doctrine between 1968 and 1986 reflect the three stages of Kuhn's paradigm of revolutionary change. Profound anomalies were discovered in the initial paradigm causing a crisis. The crisis was resolved by replacing the discredited paradigm with a new one that resolved the anomalies and promised better application in the future.

The development of American tactical doctrine from World War II to 1973 reflects Kuhn's first stage, the quiet stage of extension of knowledge through the application of an accepted paradigm. During that time, the basic doctrinal paradigm for minor tactics was expanded to reflect new technologies, threats, and strategies. The helicopter was developed and included as were new and more powerful weapons. Experience in various theaters after World War II permitted the expansion of concepts and led to the refinement of tactical doctrine to meet a variety of situations in various theaters. These changes were evolutionary, not revolutionary. The only attempt at revolutionary change occurred during the late 1950s with the Pentomic Division, which the Army rejected after a brief, trial period. The ROAD divisional concept that replaced it was a reversion back to the successful World War II paradigm, with which the Army was comfortable. In regards to

this monograph, the first stage is evident in the time period from 1968 to 1973 - before both the change in strategic focus and the 1973 Arab-Israeli War.

Kuhn's emphasis on the role of anomalies in sparking a shift in paradigms is clearly evident in the experience of doctrinal change in the US Army following the proclamation of the Nixon Doctrine and in the aftermath of the 1973 Arab-Israeli War. The lost war in Asia, the lack of preparedness of US forces in Europe, and the stark realities of the war in the Middle East, shook the existing doctrinal paradigm to its very foundation. The "new lethality" demonstrated conclusively to the US Army that the Army's minor tactical doctrinal paradigm, based on the experience of World War II, was outdated and did not provide the answers for the present battlefield. That doctrine could evolve no more and had to be changed.

Kuhn's second stage - attempted modifications of the old paradigm and competition between new, emerging paradigms - is apparent in the period from 1973 to 1982. The period was marked by great doctrinal debate when various concepts emerged as candidates to replace the 1968 paradigm. The TRADOC commander attempted to replace the old doctrine with Active Defense, a doctrine that espoused a solution by means of tactical technique to the anomalies exposed in the 1973 War. However, the 1976 doctrinal paradigm did not receive the approval of the Army or the defense community because it did not contain the necessary promise of success on European battlefields for which it was intended. Active Defense might have solved the minor tactical anomalies uncovered in the 1973 Arab-Israeli War, but it would not solve the problem in Europe. Active Defense could only defeat the first operational echelon. It could not deal with the problem of follow-on echelons.

The search for a new paradigm continued after 1976. A new group, under the leadership of General Starry, attempted to modify Active Defense to solve the problem of Soviet follow-on echelons. They realized that there was not a minor tactical solution to the anomalies. The solution to the anomalies "would have to be gained by operational virtuosity."¹³³ The doctrine writers turned to a new way of thinking about the European battlefield, AirLand Battle. The officer corps and defense community accepted this new paradigm. Not only did it solve the tactical anomalies made apparent in the 1973 War and under the 1976 doctrine, it also promised universal applicability in any theater of operations. The acceptance of AirLand Battle marked the arrival at Kuhn's third stage – resolution of the crisis by a revolutionary shift in paradigms.

The time period after 1982 reflects a return to Kuhn's first stage – normal science. The Army expanded and refined their paradigm by publishing a new edition of FM 100-5 in 1986, which clarified the paradigm and expanded its application in theaters of operations and in campaigns. The Army focused its efforts on developing operational art and preparing its leaders to creatively apply operational art on the battlefield.

To prove that the tactical paradigm inherent in AirLand Battle was a revolutionary shift from that of 1968, the new paradigm must be compared to the three criteria modified from Kuhn's theory. The first criteria is that the U.S. Army was forced to reject a time-honored tactical doctrine in favor of another incompatible with it. This certainly occurred during the period. The Army replaced its World War II based tactical paradigm with a new tactical paradigm, the Active Defense. Although the Active Defense did not receive the initial approval of the officer corps and defense community in 1976 when first published, it did eventually. It failed to do so as a stand-alone tactical doctrine.

However, when imbedded in an effective operational concept, AirLand Battle, it was accepted.

The acceptance of the minor tactical paradigm of Active Defense was not all together visible to the Army. However, an examination of subordinate tactical manuals and Army training documents demonstrates that the minor tactical paradigm of those manuals is essentially that of the 1976 edition of FM 100-5. The only modifications to the tactical paradigm were in the use of reserves, an emphasis on initiative and offensive action, and the rediscovery of the intangible elements of combat power, such as leadership.

The second criteria is that the new doctrine produced a consequent shift in the problems available for tactical scrutiny and in the standards for that which the military profession determined should count as an admissible problem or as a legitimate problem-solution. The 1976 minor tactical paradigm stressed that the old methods for solving tactical problems were no longer valid. The problem had expanded. The close cooperation of only infantry and artillery was insufficient to achieve victory. The new problem at the minor tactical level included dealing with the effects of more lethal firepower, ATGMs, and closely integrated, combined arms formations. Now the legitimate problem-solution was the use of the combined arms team, which included air power, at the minor tactical level. With such a solution the force could survive in the "new lethality" of the modern battlefield. The combined arms unit at the minor tactical level - tanks, armored infantry, anti-armor, air defense, and air support - had to support each other on the battlefield to destroy the enemy and to survive. This requirement spawned new movement techniques, formations, and roles for each member of the combined arms team. Each arm had to work actively with the others to mass against a

numerically superior force and the combined arms team had to be qualitatively better than the enemy. These requirements placed a premium on highly trained, skilled, and ready leaders, crews, and teams, to "fight outnumbered, and win."

The third criteria is that the new doctrine transformed the military imagination in ways that would ultimately need to be described as a transformation of the world within which tactical work was done. The Active Defense doctrine changed the world-view or gestalt of the Army. Army officers saw the modern battlefield through the prism of the new doctrine. They spoke that way, wrote that way, and thought that way. The officers and men who trained and fought under the new doctrine saw their tactical problem differently. They recognized the "new lethality" of the modern battlefield. They knew that they were highly dependent on cooperation with the Air Force to fight the deep battle. They knew that they would not have a quantitative advantage to defeat the enemy. They knew that they could not defend in operational depth, but that they had to work together at a very high level of skill to defeat the numerically superior enemy. They could not rely on mobilization, but only on their skills, which they had to maintain at the highest levels. This was a dramatic change in thinking from the pre-1976 doctrine Army, which had relied heavily on mobilization to defeat the enemy. That army had repeatedly lost its first battles and awaited mobilization to beat the enemy with superior numbers. The new army could fight outnumbered and win, and it possessed the confidence in its doctrine to do so. This was demonstrated decisively in the Gulf War.

CONCLUSION

This monograph sought to answer the following research question. *Does the change in tactical thought in the U.S. Army from 1968-1986 fit Thomas Kuhn's theory of the structure of scientific revolutions?* The answer to the research question is – yes, the changes do fit Kuhn's theory. The proof is found in the answers to the following subordinate questions. What is Kuhn's theory of the structure of scientific revolutions? Is doctrine the same as Kuhn's paradigm? Was the change in tactical doctrine between 1968 and 1986 revolutionary in nature? That is, does the change in tactical doctrine fit Kuhn's three criteria for revolutionary change?

Kuhn's theory provided a framework for understanding how scientific revolutions develop, progress, and conclude. The theory also offered a standard for evaluating revolutionary change. The comparison of Army doctrine to Kuhn's paradigm demonstrated that doctrine in the Army conforms to the role of paradigms in science. The positive comparison permitted application of Kuhn's model to shifts in tactical doctrine. Analysis of the changes in the Army's minor tactical doctrine demonstrated that the shift in doctrine was indeed revolutionary because it conformed to the three criteria modified from Kuhn's theory. First, the U.S. Army was forced to reject a time-honored tactical doctrine in favor of another incompatible with it. Second, the new doctrine did produce a consequent shift in the problems available for tactical scrutiny and in the standards for that which the military profession determined should count as an

admissible problem or as a legitimate problem-solution. Third, the new doctrine transformed the military imagination in ways that would ultimately be described as a transformation of the world within which tactical work was done.

Although this monograph has demonstrated that Kuhn's model of the structure of scientific revolutions can be applied to the changes in Army tactical doctrine that occurred between 1968 and 1986, it did not explain why Kuhn's model fit this shift in tactical doctrine. The first reason may be that doctrine played an important role in Army during this time period.¹³⁴ General DePuy, through the force of his personal efforts to give the Army a suitable doctrine, engendered a debate about doctrine that made the Army a "doctrinally-oriented army to an extent hitherto unknown in the American military experience."¹³⁵ This orientation, in a large part, is due to an idea that accompanied the 1976 manual, "*that it [doctrine] should be followed.*"¹³⁶

General DePuy, whether or not he recognized the crucial role that paradigms play, made a fortuitous decision when he chose doctrine as the engine of change.¹³⁷ He made the doctrinal paradigm central to the organization's existence by linking to it force structure, education, and training standards.¹³⁸ He also linked equipment procurements to the doctrine, effectively using the doctrine as a means for lobbying Congress for needed weapons and equipment.¹³⁹ If the Army paid little attention to doctrine prior to 1976, it certainly paid a great deal of attention to it after the publication of the 1976 manual. Doctrine became a frequent topic of discussion in the Army.¹⁴⁰ DePuy overcame the Army's doctrinal malaise and started the great doctrinal debate that continued throughout the period studied in this monograph.¹⁴¹ In doing so, he made the Army more like a scientific community – it worked on the basis of a universally shared doctrine.

Another reason why Kuhn's model fits doctrinal change in this period is that the Army was especially poised in the early 1970s to recognize profound anomalies. The Army's readiness to recognize anomalies was due to several unrelated causes. The loss in Vietnam shattered the Army and forced it to turn inwards in a search for lessons on its conduct of the war. This search "conditioned the doctrinal revolution in the Army."¹⁴² In his semi-official study of the Vietnam War, Colonel Harry Summers criticizes the Army's understanding of the levels of war during the war. The Army did not understand "that the activity of conducting campaigns and major operations comprehended more than just fighting battles."¹⁴³ Summers demonstrated that tactical successes alone in Vietnam were insufficient for achieving strategic objectives.¹⁴⁴ Good operational linkages were needed to ensure that tactical actions supported strategic objectives.

Secondly, the refocusing of the Army's effort back to Europe and against the Warsaw Pact substantially underscored the need for a viable warfighting doctrine. The threat was powerful and menacing, and the Army was unprepared. A solution was urgently needed and the answer would not be found in a quantitative approach.

Lastly, the timeliness of the 1973 Arab-Israeli War served as a prime mover for change. It also provided a laboratory for analyzing tactical concepts as well as a benchmark to gage their viability.¹⁴⁵ The war was timely because it occurred during a period when the Army was just beginning to recognize the "new lethality" of late twentieth century armored warfare. The war painted a dramatic picture of the "new lethality" that exposed a profound anomaly in the Army's tactical doctrine. It is interesting to speculate whether a revolution in tactical doctrine would have occurred

without the timely historical accident of the 1973 War occurring just as the Army began thinking that its doctrine was unsuitable for present conditions.

Another reason that Kuhn's model fits the shift in tactical doctrine during this period may be that personalities played a vital role. General DePuy had a reputation as an energetic, impatient officer with a blunt, tactless leadership style.¹⁴⁶ He basically thrust the 1976 doctrine upon the Army without giving the Army much of a say in its development. He bypassed the traditional institution for writing doctrine, Fort Leavenworth, and wrote the manual with a team of his own writers.¹⁴⁷ His heavy-handed methods to force the doctrine through the approval process enraged the Army.¹⁴⁸ The Army essentially saw the 1976 manual as DePuy's doctrine, not as its own.¹⁴⁹ DePuy's methods and his controversial manual sparked a wide-ranging debate about doctrine and about the doctrinal process itself. That debate led to the 1982 and 1986 editions of FM 100-5.

General Starry, who succeeded General DePuy as the commander of TRADOC, noted the Army's inimical response to DePuy's methods. He guided the 1982 doctrine through the development and approval process in a different, more traditional manner. He maintained a distance from the process of doctrinal development and ensured that the Army, to include Fort Leavenworth, was involved in developing the 1982 edition of FM 100-5. Starry understood that *how* TRADOC wrote its doctrine mattered just as much as its content.¹⁵⁰ Starry, like Kuhn, understood the critical role that communities play in approving a new paradigm.

The applicability of Kuhn's model to the shift in tactical doctrine in this time period begets another issue. What is the value of Kuhn's model for the Army today? The Army

today sees itself in a period of transition that will continue for the next few decades as it moves through "Force 21" to the "Army After Next." Can Kuhn's model be of any value for this transition? His model may be of less value than what it readily seems. Kuhn's model is descriptive in nature and cannot be used for predicting the future. In *The Structure of Scientific Revolutions*, Kuhn did not predict any future scientific revolutions nor did he provide any tools for predicting them. Although Kuhn's model lacks a predictive capability, it can be useful for forecasting. Determining the nature of future war is a major part of an Army's business, especially in peacetime. Correctly determining the nature of future warfare is a very difficult task for an army to accomplish, particularly as the complexity of warfare continues to increase.¹⁵¹ Forecasting, in Kuhnian terms, should focus around an understanding of anomalies and how they effect doctrine.

In *Military Misfortunes*, Eliot Cohen and John Gooch write about the necessity of a military organization to learn, anticipate, and adapt.¹⁵² According to the authors, failures in these areas are failures of organizations in war, not of individuals.¹⁵³ Kuhn's theory, in particular, applies to the ability of an organization to anticipate.¹⁵⁴ Cohen and Gooch defined "failure to anticipate" as the inability to foresee and take appropriate measures to deal with unexpected situations.¹⁵⁵ Kuhn's model emphasizes the value of understanding anomalies, especially those that cause crisis. Anomalies are not foreseen, but when uncovered, they point to deficiencies in the paradigm. Therefore, anomalies should not be ignored, but rather, should be resolved. Resolution may require a new paradigm.

A more timely matter is the Army's present struggle with developing doctrine for Operations Other than War (OOTW). Kuhn wrote that a scientific revolution changes the

problem-solution set for a given science. The opposite can be true as well: A change in the problem-solution set can cause a crisis that leads to a paradigm shift.¹⁵⁶ Such a crisis exists in the Army today. Since the end of the Cold War, the US military has been involved frequently in OOTW. Such a use of the military extends the profession from executing strictly warfighting tasks to executing a varied set of tasks, many of which are not directly connected to warfighting. The extension of tasks is having the same effect on the Army as a paradigm shift. There are new problems for the Army to solve and new problem-solution sets that dictate how the Army is to solve these problems. These new problem-solution sets are straining the Army as it struggles to adapt to a new and still inchoate paradigm, that is broader in scope than the previous, purely warfighting paradigm.

The new problem-solution sets that are emerging for the Army do not necessarily portend a revolution in military science, but rather a shift in the application of military force. Such a radical shift, from pure combat operations to operations other than war, brings with it uncertainties as the profession struggles to come to grip with the new problems. These uncertainties are reflected today in the challenges the Army faces with resources, OPTEMPO, and educational and training challenges for OOTW. The struggles and issues are all manifestations of the shift currently in process. It is not that the mission of the Army became harder, the mission is different.¹⁵⁷

Kuhn can also lend some value to current arguments about a "revolution in military affairs." His three criteria for demonstrating that a revolution has occurred can be applied to changes in doctrinal concepts to determine the true nature of the change,

evolutionary or revolutionary. His criteria could be used as a standard for judging future revolutions in military affairs as well.

Although one cannot say with certainty what will cause a radical shift in the Army's doctrine in the future, it is possible to speculate given Kuhn's theory. From this monograph it is possible to assert a few factors that could dramatically change the Army's tactical doctrine. These factors are as follows: a radically changed strategic policy; the appearance of a dramatically different enemy; a new technology; a new type of operational art; or a broadening of the tasks expected of the Army. Any of these factors could uncover an anomaly in the present tactical doctrine.

The main lesson from this monograph may be an understanding of anomalies. When an anomaly is discovered in its tactical paradigm, the Army may take one of two courses of action. The first is to ignore it. This solution may lead to "a failure to anticipate," as Cohen and Gooch have warned. The second solution is to solve it. That act may require individuals with great intellectual capacity and a thorough understanding of military theory, who understand the complexities of the environment, the significance of the contemplated change, and the challenges that the Army and its doctrinal paradigm will face in the future. During times of crisis, these individuals can recall the words of Clausewitz as they strive to leverage theory to develop new doctrinal paradigms.

[Theory] can give the mind insight into the great mass of phenomena and of their relationships, then leave it free to rise into the higher realms of action. There the mind can use its innate talents to capacity, combining them all so as to seize on what is *right* and *true*....¹⁵⁸

These future reformers should understand that "knowing why, when and how to change is key to maintaining an Army's effectiveness."¹⁵⁹

NOTES

¹The national strategy changed, and within it, the role of the ground forces. The Army re-deployed from the Vietnam War and reoriented itself on the defense of Western Europe. The volunteer army replaced the draft army. The army struggled to regain the credibility it had lost with the American populace during the Vietnam War. After a decade of lapse, the Army's equipment had to be replaced and modernized. Morale from the loss in Vietnam had to be built back up. For a discussion of how doctrine was used as the agent of change see Roger J. Spiller, "In the Shadow of the Dragon: Doctrine and the US Army After Vietnam," *The Journal of the Royal United Services Institute for Defence Studies* vol. 142, no 6 (December 1997), 41-54.

²Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2d ed., (Chicago: The University of Chicago Press, 1970), viii.

³*Ibid.*, 175.

⁴*Ibid.*, 10.

⁵*Ibid.*, 11.

⁶*Ibid.*, 43-44.

⁷*Ibid.*, 175.

⁸General William E. DePuy, "Unification: How Much More?," in *Army* 11 (April 1961): 30-38. Reprinted in *Selected Papers of General William E. DePuy*, 36. Hereinafter, *Selected Papers*.

⁹Carl von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 146.

¹⁰See Steven Weinberg, "The Revolution That Didn't Happen," *The New York Review* (8 October 1998: 48-52.

¹¹Kuhn, viii.

¹²*Ibid.*, 10.

¹³*Ibid.*, 11.

¹⁴*Ibid.*, 43-44.

¹⁵*Ibid.*, 52.

¹⁶*Ibid.*, 56.

¹⁷*Ibid.*, 52.

¹⁸Ibid., 67-71.

¹⁹Ibid., 84.

²⁰Ibid., 74-75.

²¹Ibid., 77.

²²Ibid., 80, 83-84.

²³Ibid., 77.

²⁴Ibid., 95-98. This is also one of the main criticisms of Kuhn's theory, which he acknowledges and clarifies in his "Postscript – 1969" in the second edition, 175. For a critique of Kuhn's argument, see Steven Weinberg, "The Revolution That Didn't Happen," *The New York Review* (8 October 1998): 49.

²⁵Ibid., 106, 109.

²⁶Ibid., 84-85.

²⁷Ibid., 6.

²⁸Christopher R. Gabel, "Active Defense," in *Combined Arms in Battle Since 1939*, ed. Roger J. Spiller (Fort Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, 1992), 91.

²⁹U.S. Department of the Army, FM 100-5, *Operations* (Washington, D.C., May 1986), i. Hereinafter, FM 100-5 (1986).

³⁰Spiller, 41.

³¹I am indebted for this insight to Dr. James H. Schneider, Professor of Theory, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS, 7 October, 1998.

³²Gabel, 91.

³³Clausewitz, 146.

³⁴John L. Romjue, *From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982*, (TRADOC Historical Monograph Series. Fort Monroe, VA: Historical Office, U.S. Army Training and Doctrine Command, 1984), 13-14. Also, see Spiller, 52, and Richard M. Swain, "Filling the Void: The Operational Art and the U.S. Army," in *The Operational Art: Developments in the Theories of War*, ed. B.J.C. McKercher and Michael A. Hennessy, (Westport, CT: Praeger Publishers, 1996), 148.

³⁵Paul H. Herbert, *Deciding What Has to Be Done: General William E. DePuy and the 1976 Edition of FM 100-5, Operations*, (Leavenworth Papers no. 16. Fort Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, 1988), 26-27.

³⁶The most radical change in the intervening years, the Pentomic division, was rejected after a trial period. Although the Army developed concepts and doctrine for the Pentomic Division, a version of FM 100-5 reflecting these concepts was not published. For an explanation of the radical concepts of the Pentomic Division and reasons for development and rejection of the concept, see Robert A. Doughty, *The Evolution of US Army Tactical Doctrine, 1946-1976*, Leavenworth Papers no. 1, Fort Leavenworth, KS; Combat Studies Institute, U.S. Army Command and General Staff College, 1979, 16-19; and A. J. Bacevich, *The Pentomic Era: The US Army Between Korea and Vietnam*, Washington, DC: National Defense University Press, 1986.

³⁷U.S. Department of the Army, FM 100-5, *Operations of Army Forces in the Field*. (Washington, D.C., September 1968), 1-2. Hereinafter, FM 100-5 (1976).

³⁸Doughty, 25-40.

³⁹*Ibid.*, 38.

⁴⁰FM 100-5, (1968), pp. 6-5 and 6-13.

⁴¹General Donn A. Starry, "A Tactical Evolution – FM 100-5," *Military Review* LVIII (August 1978): 3.

⁴²ARCOV: Basic Report, op. Cit., Volume 2, p II-43, as quoted in Doughty, 38-39.

⁴³Doughty, 38-40.

⁴⁴General William E. DePuy, Letter to General Walter T. Kerwin, Jr., 24 March 1977. Reprinted in *Selected Papers*, 213.

⁴⁵FM 100-5 (1976), p. 5-2.

⁴⁶The Army Chief of Staff, General Abrams, obtained political support for the development and purchase of "the big five:" the M1 Tank, M2/3 Bradley Fighting Vehicle, M60 Blackhawk Helicopter, the AH-64 Apache Gunship, and the Patriot Air Defense System.

⁴⁷George W. Gawrych, *The 1973 Arab-Israeli War: The Albatross of Decisive Victory* (Leavenworth Papers no. 21, Fort Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, 1996), 7-8.

⁴⁸Gabel, 92.

⁴⁹Romjue, 16.

⁵⁰General William E. DePuy, "Keynote Addresss at TRADOC Leadership Conference, 22 May 1974." Reprinted in *Selected Papers*, 115.

⁵¹Herbert, 31.

⁵²General (Ret) Donn A. Starry, Fairfax Station, VA to Dr. Richard M. Swain, Fort Leavenworth, KS, 7 June 1995. Letter in possession of Dr. Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Fort Leavenworth, KS, 6. General Starry was the commander of the Armor School when the 1976 FM 100-5 was written, later V Corps commander in Europe, and TRADOC commander during the drafting of the 1982 FM 100-5. Hereinafter, Starry letter, 7 June 1995.

⁵³Ibid., 5.

⁵⁴Spiller, 43.

⁵⁵Romjue, 6.

⁵⁶Gabel, 92.

⁵⁷Herbert, 65.

⁵⁸Richard M. Swain, "AirLand Battle," (Paper awaiting publication and in possession of the author), 5.

⁵⁹FM 100-5, (1976), 1-2.

⁶⁰Ibid., i.

⁶¹Gabel, 92-93.

⁶²Starry letter, 7 June 1995, pp. 3, 10.

⁶³General William E. DePuy, Letter to Senator John C. Culver, 12 May 1975. Reprinted in *Selected Papers*, 165.

⁶⁴Herbert, 35.

⁶⁵James M. Dubik and James J. Montano, "FM 100-5: Conceptual Models and Force Design," *Military Review* LXIV no. 7 (July 1984): 17.

⁶⁶Herbert, 34.

⁶⁷General William E. DePuy, Letter to Senator John C. Culver, 12 May 1975. Reprinted in *Selected Papers*, 166.

⁶⁸Herbert, 26.

⁶⁹General William E. DePuy, Modern Battle Tactics [17 August 1974]. Reprinted in *Selected Papers*, 137.

⁷⁰General William E. DePuy, Letter to Major General David E. Ott et al., 23 July 1974, with draft concept paper, Concept Operations ["Pot of Soup" letter]. Reprinted in *Selected Papers*, 122.

⁷¹General William E. DePuy, Letter to General Walter T. Kerwin from General DePuy, 24 March 1977. Reprinted in *Selected Papers of General William E. DePuy*, 213- 214 [Emphasis is DePuy's].

⁷²Herbert, 34-35.

⁷³General William E. DePuy, Active Defense [n.d.]. Reprinted in *Selected Papers*, 141.

⁷⁴FM 100-5, (1976), 3-4. [Emphasis in manual].

⁷⁵Gabel, 93.

⁷⁶Starry letter, 7 June 1995, 10.

⁷⁷General Donn A. Starry, "A Tactical Evolution – FM 100-5," *Military Review* LVIII (August 1978): 7.

⁷⁸Gabel, 94.

⁷⁹General Donn A. Starry, *A Tactical Evolution – FM 100-5*, 9; and Richard M. Swain, "AirLand Battle," 18. General Donn Starry wrote that in the 1976 edition the idea of the reserves was mispercieved more than any other.

⁸⁰FM 100-5, (1976), 8-1. [Emphasis in manual].

⁸¹*Ibid.*, 8-2.

⁸²*Ibid.*

⁸³I am indebted for this insight to Dr. Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS. The army essentially declared its dependence on Air Force assets to fight the deep battle. The manual states, "In fact, the Army consciously avoids the development of weapons or equipment to perform functions which the Air Force can perform more effectively."

⁸⁴John L. Romjue, *From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982*, (TRADOC Historical Monograph Series. Fort Monroe, VA: Historical Office, U.S. Army Training and Doctrine Command, 1984), 13.

⁸⁵Jeffrey Record, "The October War: Burying the Blitzkrieg," *Military Review*, LVI (April 1976): 19.

⁸⁶*Ibid.*, 21.

⁸⁷DePuy believed if doctrine could solve the worst case (Europe), it had solved them all.

⁸⁸Gabel, 94.

⁸⁹Spiller, 51.

⁹⁰Romjue, 13-21.

⁹¹William S. Lind, "Some Doctrinal Questions for the United States Army," *Military Review* 57 (March 1977): 54.

⁹²*Ibid.*, 57.

⁹³*Ibid.*, 58-65.

⁹⁴Philip A. Karber, "Strategy: In Defense of Forward Defense," *Armed Forces Journal International* 121 (May 1984): 40-42.

⁹⁵Gabel, 94.

⁹⁶Paul E. Cate, "Large Unit Operational Doctrine," *Military Review* LVIII (December 1978): 40-41, 44.

⁹⁷General John W. Woodmansee, Jr., "Blitzkrieg and the AirLand Battle," *Military Review* LXIV (August, 1984): 25.

⁹⁸Romjue, 16-17, and John S. Doerner, "The Operational Art of the Airland Battle," *Military Review*, LXII (May 82), 4. A detailed analysis of the Soviet threat was not included in the manual. It can be found in FM 100-2-1, *The Soviet Army, Operations and Tactics*, July 1984, pp. 4-1 to 4-9.

⁹⁹The M1 Tank, M2/3 Bradley Fighting Vehicle, M60 Blackhawk Helicopter, AH-64 Apache Gunship, and Patriot Air Defense System

¹⁰⁰Starry letter, 7 June 1995, 18.

¹⁰¹Huba Wass de Czege and L. D. Holder, "The New FM 100-5," *Military Review* LXII (July, 1982): 55.

¹⁰²U.S. Department of the Army, FM 100-5, *Operations*, (Washington, D.C., August 1982), 2-1. Hereinafter, FM 100-5 (1982).

¹⁰³Robert H. Scales, *Certain Victory: The US Army in the Gulf War* (Fort Leavenworth, KS: US Army Command and General Staff College Press, 1994), 26.

¹⁰⁴Wass de Czege and Holder, 57-61.

¹⁰⁵Richard M. Swain, "Filling the Void: The Operational Art and the U.S. Army," in *The Operational Art: Developments in the Theories of War*, ed. B.J.C. McKercher and Michael A. Hennessy, (Westport, CT: Praeger Publishers, 1996), 159.

¹⁰⁶Wass de Czege and Holder, 65.

¹⁰⁷Scales, 25.

¹⁰⁸These physical elements include weapons, terrain, time, distance, and quality and quantity of equipment. US Army Command and General Staff College, Memorandum by Colonel Huba Wass de Czege for Reviewers of FM 100-5, dated 1 July 1985, Subject: The Nature and Reasons for Changes in This Edition, in archives of US Army Command and General Staff College, Fort Leavenworth, KS, file CGSC 86, SAMS-0019, p. 2. Hereinafter, Wass de Czege memo.

¹⁰⁹FM 100-5, (1982), pp. 2-4 to 2-6; and Wass de Czege memo, 2.

¹¹⁰FM 100-5, (1982), pp. 2-1 to 2-3; and Wass de Czege memo, 2.

¹¹¹Swain, "AirLand Battle," 23.

¹¹²FM 100-5 (1982), 2-1.

¹¹³Swain, "AirLand Battle," 8-9; and Starry letter, 7 June 1995, 3-4. Studies were conducted by Bob Hembold in a report to a NATO operations analysis conference in the late 1950's. Hembold's findings refuted the conceptions of F.W. Lancaster, who observed that the outcome of battle could best be predicted by comparing force ratios at the beginning of the battle.

¹¹⁴Huba Wass de Czege and L. D. Holder, 64-69.

¹¹⁵Archer Jones, "FM 100-5: A View From the Ivory Tower," *Military Review*, LXIV (May 84), 20.

¹¹⁶*Ibid.*, 21.

¹¹⁷I am indebted for this insight to Dr. Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS.

¹¹⁸Swain, "AirLand Battle," 28-29; and Wass de Czege memo, 4-5.

¹¹⁹Swain, "Filling the Void," 163-164.

¹²⁰FM 100-5, (1982), 2-3.

¹²¹Swain, "Filling the Void," 160.

¹²²In several ways, the 1986 edition had continuity with the 1982 edition. The same authors, Colonel Huba Wass de Czege and Lieutenant Colonel L. D. Holder, were brought back to Fort Leavenworth to write the new edition. Additionally, The School of Advanced Military Studies was founded in 1983 to think through and revise the Army's doctrine on operational matters. I am indebted for this insight to Dr. Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS.

¹²³Wass de Czege memo, 1.

¹²⁴*Ibid.*, 2. Between 1976 and 1982 various articles were published in both *Military Review* and *Army* that discussed new operational concepts that reflected the process of transition from Active Defense to AirLand Battle. These concepts, in order of succession, were: Corps Battle, Central Battle, Integrated Battle, Extended Battle, and, finally, AirLand Battle.

¹²⁵*Ibid.*

¹²⁶*Ibid.*, 3-4.

¹²⁷*Ibid.*, 3.

¹²⁸*Ibid.*

¹²⁹*Ibid.*, 2.

¹³⁰Swain, "Filling the Void," 164.

¹³¹U.S. Department of the Army, FM 100-5, *Operations*, (Washington, D.C., May 1986), 10.

¹³²While a student in CGSC and in SAMS, the author witnessed many such discussions between faculty members and students when discussing operational art and tactics. The 1993 edition of FM 100-5 did not seem to meet their expectations in these areas.

¹³³I am indebted for this insight to Dr. Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS.

¹³⁴This monograph does not assert that Kuhn's theory is applicable to any radical shift in the Army's doctrine, either in the past or in the future. The monograph does not address whether a doctrinal paradigm always governs the Army. Rather, it is only clear from this monograph that doctrine played a major role between 1968 and 1986.

¹³⁵Spiller, 52.

¹³⁶Swain, "Filling The Void," 152. [Emphasis in original]

¹³⁷Spiller, 43.

¹³⁸Training standards were established through the ARTEP series of manuals. See General Paul F. Gorman, *The Secret of Future Victories*, (Fort Leavenworth, KS: Combat Studies Institute, U.S. Army Command and General Staff College, 1992).

¹³⁹Spiller, 48, 52.

¹⁴⁰Spiller, 52.

¹⁴¹The 1976 manual proved to be the most controversial manual in history of Army. It also proved to be a manual that was greatly underestimated both in terms of its perception and its long-term influence. See Swain, "Filling the Void," 151.

¹⁴²Swain, "Filling The Void," 148.

¹⁴³Swain, "AirLand Battle," 26.

¹⁴⁴Harry G. Summers, *On Strategy, A Critical Analysis of the Vietnam War* (Novato, CA: Presidio Press, 1982; Dell Publishing, 1984), 21.

¹⁴⁵Spiller, 45-46.

¹⁴⁶Herbert, 11.

¹⁴⁷See Herbert, Chapters 5 and 7.

¹⁴⁸DePuy foisted the doctrine on the Army through his control of the school system, training circulars, and doctrinal development. He took advantage of the power vacuum caused by the death in office of the Army Chief of Staff, General Creighton W. Abrams, to overcome the Army's bureaucracy and push through his own ideas on doctrine. DePuy also persuaded the German's to approve the US doctrine, which emasculated the influence of US Army Europe on Army doctrine. See Spiller, 48-50; and Herbert, 103-106.

¹⁴⁹Spiller, 52; and Herbert, 103-106.

¹⁵⁰Starry letter, 7 June 1995, 22.

¹⁵¹Michael Howard, "Military Science in an Age of Peace," *RUSI, The Journal of the Royal United Services Institute for Defence Studies* 119 (March 1994): 3.

¹⁵²Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: The Free Press, 1990), 26-28.

¹⁵³*Ibid.*, 3, 14-16.

¹⁵⁴I am indebted for this insight to Dr. James H. Schneider, Professor of Theory, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS, 24 November, 1998.

¹⁵⁵Cohen and Gooch, 27.

¹⁵⁶I am indebted for this insight to Dr. James H. Schneider, Professor of Theory, School of Advanced Military Studies, US Army Command and General Staff College, Ft. Leavenworth, KS, 24 November, 1998.

¹⁵⁷*Ibid.*

¹⁵⁸Clausewitz, 698-699.

¹⁵⁹Huba Wass de Czege, "How to Change an Army," *Military Review* LXIV (November, 1984): 33.

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Letters

Holder, Lieutenant General L. D., Commandant, Combined Arms Center, Ft. Leavenworth, KS 66027 to Richard M. Swain, Fort Leavenworth, KS, June 30, 1997, 8:20AM. Subject: Paper for Starry Book. Copy in the hand of Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Fort Leavenworth, KS.

Sinnreich, Rick, Lawton, OK to Richard M. Swain, Fort Leavenworth, KS, June 30, 1997, 3:05 PM. Subject: Papers Received. Copy in the hand of Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Fort Leavenworth, KS.

_____. Lawton, OK to Richard M. Swain, Fort Leavenworth, KS, June 30, 1997, 8:36 PM. Subject: Papers Received. Copy in the hand of Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Fort Leavenworth, KS.

Starry, Donn A, Fairfax Station, VA to Richard M. Swain, Fort Leavenworth, KS, 7 June 1995. Letter in possession of Richard M. Swain, School of Advanced Military Studies, US Army Command and General Staff College, Fort Leavenworth, KS.